REMARKS

In response to the Office Action, Applicant respectfully requests the Examiner to reconsider the above-captioned application in view of the foregoing amendments and the following comments.

Request for Rejoinder

Upon allowance of Group I claims, Applicant respectfully requests rejoinder of withdrawn Claims 6-8, 11-12, and newly added 22-26, which ultimately depend from the elected Claim 1

Specification

The specification has been objected to because the abstract was too long. The abstract was amended to be within 150 words.

Recitations "Figure 1", "Figure 2", or "Figure 3" has been replaced with "FIG.1", "FIG.2", or "FIG. 3" as the Examiner suggested. Clerical errors have been corrected as well. Applicants respectfully request withdraw the objections.

Discussion of the Claim Rejections Under 35 U.S.C. § 103

Claims 1-5, 9-10, and 13-18 have been rejected under 35 U.S.C. § 103 as being unpatentable over Hutchinson. (U.S. Publication Number 2003-0077625) Applicant respectfully submits that claims are allowable over Hutchinson, as discussed below.

Discussion of Patentability of Independent Claims 1

As amended herein, Claim 1 recites, among other things, "the coordinate–bonding to the metal element by the lone pairs". Hutchison teaches "substantially monodisperse ligand-stabilized nanoparticles" in which "nanoparticle" is defined as having a diameter of from about 0.7nm to about 5 nm in terms of diameter of the metal nanoparticle (core) of the "ligand-stabilized nanoparticle" [0028], for instance, such as thiol-baseo nanoparticles of the formula CORE-(SR)n, where the R-group is selected from the group consisting of phenyl, biphenyl, alkyl groups having 20 or fewer carbon atoms, and **n** is at least one. [0092]

In the case of thiol-based nanoparticles of the formula CORE-(SR)n, such as 1.4 nm thiol-stabilized gold particles of Example 3, i.e. $Au_{55}(SC_{18}H_{37})_{26}$, the thiol ligand of the formula HS-R, i.e. HS- $C_{18}H_{37}$, covalently attaches the sulfhydryl group (HS-) thereof to the metal (i.e. Au-S- R). Thus, in the case of thiol-based nanoparticles of the formula CORE-(SR)n, the thiol ligand of the formula HS-R by no means non-covalently binds on the metal via coordinate-bonding by lone pairs existing in S atom of HS-R.

Similary, in the case of amine-based nanoparticles of the formula CORE-(NHR)n, the amine ligand of the formula H_2N-R covalently attaches the amino group (H_2N-) thereof to the metal M (i.e. M-NH-R). Thus, in the case of amine-based nanoparticles of the formula CORE-(NHR)n, the amine ligand of the formula H_2N-R by no means non-covalently binds on the metal via coordinate-bonding by a lone pair existing in N atom of H_2N-R.

Thus, Hutchinson fails to provide any evidence suggesting that such a metal nanoparticle, of which the surface is coated with one compound or more which has a group containing a nitrogen, oxygen or sulfur atom and capable of coordinate-bonding by lone pairs existing in these atoms as a group capable of coordinate-bonding to a metal element contained in the metal nanoparticle,

wherein the coating of said one or more compounds having the group containing the nitrogen, oxygen or sulfur atom on the surface of the metal nanoparticle is attained through the coordinate-bonding to the metal element by the lone pairs existing in the nitrogen, oxygen or sulfur atom contained in the group. Whereby, the compound that is consisting of the coating will be easily removed from the surface of the metal nanoparticle by heating at such a low temperature of 150°C to 300°C, resulting in low temperature sintering of the metal nanoparticle, as claimed in Claim 6 of the present application

Further, Claim 1 recites, among other things, "the nitrogen, oxygen or sulfur atom is contained in a total amount of 10 to 50 parts by weight based on 100 parts by weight of said metal". Hutchinson describes that quantification of XPS spectra measured for the 1.4 nm thiol-stabilized gold particles of Example 3, i.e. $Au_{55}(SC_{18}H_{37})_{26}$, gave a gold-to-sulfur ratio of about 2.3: 1.0 in the term of ratio of number of atoms. The Au:S ratio obtained from XPS was confirmed by thermal gravimetric analysis, in which, on heating to 600°C, the thiol-stabilized

gold particles of Example 3 display a 40% mass loss, corresponding to 26 ODT (SC18H37) ligands on a 55-atom gold nanoparticle.

This result of thermal gravimetric analysis indicates that the amount of the 26 ODT ($SC_{18}H_{37}$) ligands is 40 wt.%, whereas the amount of the 55-atom gold nanoparticle is 60 wt. %, which equates to about 66 part by weight of the ODT ($SC_{18}H_{37}$) ligands per 100 part by weight of gold atoms of "nanoparticle" (core). In rejecting the claims, the Examiner asserts that a gold-to-sulfur ratio of about 2.3: 1.0 equates about 56 parts per 100 parts gold, and that it is close to enough to establish a prima facie case of obviousness, with respect to the recited "10 to 50 parts". However, as described above, Hutchinson's disclosure is 66 part by weight, instead of 56, which exceeds over 30 % of the recited range. Accordingly, one having ordinary skill in the art could in no way derive the claimed range from only the cited reference.

In addition, the result of thermal gravimetric analysis provides good evidence indicating that dissociation of the moiety of ODT ($SC_{18}H_{37}$) ligand from the ODT-stabilized nanoparticle, i.e. the dissociation of the covalent bond of Au-S-$C_{18}H_{37}$, requires heating to such a high temperature as 600°C. Thus, Hutchinson fails to provide any good evidence suggesting that the dissociation of the covalent bond of Au-S-R such as Au-S- $C_{18}H_{37}$ would be induced by heating at such a low temperature of 150°C to 300°C, in place of such a high temperature as 600°C.

Indeed, in the thermal gravimetric analysis, the temperature for the dissociation of the covalent bond is very often measured as sharp stepwise change in the weight. Thus, the result of thermal gravimetric analysis for the ODT-stabilized nanoparticle of Example 3 provides good evidence suggesting that the dissociation of the covalent bond of Au-S-$C_{18}H_{37}$ is by no means observed at such a low temperature of 150°C to 300°C, but is observed only at such a high temperature as 600°C.

Furthermore, Hutchinson fails to provide any suggestion as to a volume percentage of said dispersion solvent to be selected in the case of the metal nanoparticle having the coating, in which the one compound or more that has a group containing a nitrogen, oxygen or sulfur atom and capable of coordinate-bonding by lone pairs existing in these atoms as a group capable of coordinate-bonding to a metal element contained in the metal nanoparticle non-covalently bind on the surface of the metal nanoparticle.

Hutchinson also fails to provide any suggestion as to an ratio of metal to the one compound or more to be selected in the case of the metal nanoparticle having the coating, in which the one compound or more that has a group containing a nitrogen, oxygen or sulfur atom and capable of coordinate-bonding by lone pairs existing in these atoms as a group capable of coordinate-bonding to a metal element contained in the metal nanoparticle non-covalently bind on the surface of the metal nanoparticle.

Accordingly, Hutchinson fails to teach or suggest all of the features of each of Claim1. Therefore, Applicants respectfully submit that no *prima facie* case of obviousness has been established with respect to Claim 1. Applicants respectfully request withdrawal of the rejection.

Discussion of Patentability of Dependent Claims

The rest of the rejected claims depend from base Claim 1, and further define additional technical features of the present invention. In view of the patentability of Claim 1, and in further view of the additional technical features, Applicants respectfully submit that the dependent claims are patentable over the prior art.

Discussion of Patentability of New Claim

New Claims, 19-21 depend from Claim 1. In view of the patentability of Claim 1, Applicants respectfully submit the Claim 1 is patentable over the prior art.

CONCLUSION

In the light of the applicant's amendments to the claims and the following Remarks, it is respectfully submitted that the present application is in condition for allowance. Should the Examiner have any remaining concerns which might prevent the prompt allowance of the application, the Examiner is respectfully invited to contact the undersigned at the telephone number appearing below.

No Disclaimers or Disavowals

Although the present communication may include alterations to the application or claims, or characterizations of claim scope or referenced art, Applicant is not conceding in this

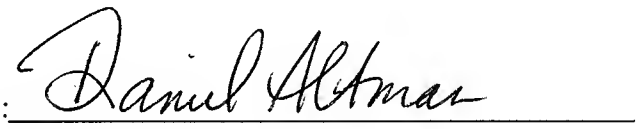
application that previously pending claims are not patentable over the cited references. Rather, any alterations or characterizations are being made to facilitate expeditious prosecution of this application. Applicant reserves the right to pursue at a later date any previously pending or other broader or narrower claims that capture any subject matter supported by the present disclosure, including subject matter found to be specifically disclaimed herein or by any prior prosecution. Accordingly, reviewers of this or any parent, child or related prosecution history shall not reasonably infer that Applicant has made any disclaimers or disavowals of any subject matter supported by the present application.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: November 10, 2009

By: 

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